

P R O P. I.

Those superficies of transparent Bodies reflect the greatest quantity of Light, which have the greatest refracting power; that is, which intercede mediums that differ most in their refractive densities. And in the confines of equally refracting mediums there is no reflexion.

The Analogy between reflexion and refraction will appear by considering, that when Light passeth obliquely out of one medium into another which refracts from the perpendicular, the greater is difference of their refractive density, the less obliquity is requisite to cause a total reflexion. For as the Sines are which measure the refraction, so is the Sine of incidence at which the total reflexion begins, to the radius of the Circle, and consequently that incidence is least where there is the greatest difference of the Sines. Thus in the passing of Light out of Water into Air, where the refraction is measured by the Ratio of the Sines 3 to 4, the total reflexion begins when the Angle of incidence is about 48 degrees 35 minutes. In passing out of Glass into Air, where the refraction is measured by the Ratio of the Sines 20 to 31, the total reflexion begins when the Angle of incidence is 40 deg. 10 min. and so in passing out of crystal, or more strongly refracting mediums into Air, there is still a less obliquity requisite to cause a total reflexion. Superficies therefore which refract most do soonest reflect all the Light which is incident on them, and so must be allowed most strongly reflexive.

But

But the truth of this Proposition will further appear by observing, that in the superficies interceding two transparent mediums, such as are (Air, Water, Oyl, Common-Glass, Crystal, Metalline-Glasses, Island-Glasses, white transparent Arsnick, Diamonds, &c.) the reflexion is stronger or weaker accordingly, as the superficies hath a greater or less refracting power. For in the confine of Air and Sal-gemm 'tis stronger than in the confine of Air and Water, and still stronger in the confine of Air and Common-Glass or Crystal, and stronger in the confine of Air and a Diamond. If any of these, and such like transparent Solids, be immersed in Water, its reflexion becomes much weaker than before, and still weaker if they be immersed in the more strongly refracting Liquors of well-rectified oyl of Vitriol or spirit of Turpentine. If Water be distinguished into two parts, by any imaginary surface, the reflexion in the confine of those two parts is none at all. In the confine of Water and Ice 'tis very little, in that of Water and Oyl 'tis something greater, in that of Water and Sal-gemm still greater, and in that of Water and Glass, or Crystal, or other denser substances still greater, accordingly as those mediums differ more or less in their refracting powers. Hence in the confine of Common-Glass and Crystal, there ought to be a weak reflexion, and a stronger reflexion in the confine of Common and Metalline-Glass, though I have not yet tried this. But, in the confine of two Glasses of equal density, there is not any sensible reflexion, as was shewn in the first Observation. And the same may be understood of the superficies interceding two Crystals, or two Liquors, or any other Substances in which no refraction is caused. So then the

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